1988
CHIGNIK AREA
OPERATIONAL PLAN

Submitted by: Mike Thompson and Jeff Fox

Regional Information Report[1] No. 4K88-26

April 1988

Alaska Department of Fish and Game
Division of Commercial Fisheries, Westward Region
211 Mission Road
Kodiak, Alaska 99615

[1]The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

PROGRAM: Management of the Chignik Area Commercial Herring and Salmon Fisheries.

PERIOD: 15 April 1988 through 15 September 1988.

FUNCTION: To assure adequate escapement of salmon and herring stocks allowing continued propagation of these stocks. To provide orderly and manageable fisheries on the harvestable surplus.

I. OBJECTIVES

A. Monitor the commercial herring fishery and spawning activity using commercial catch statistics, field crew observations, commercial herring spotter reports and ADF&G aerial surveys.

B. Monitor the salmon return, using commercial catch statistics, test fishery results, weir enumeration, and aerial surveys.

C. Estimate the proportion of the two returning sockeye runs to the Chignik Lakes system, i.e. EARLY RUN (Black Lake), LATE RUN (Chignik Lake), using scale data (AGE) and scale pattern analysis of samples obtained from the commercial fishery and spawning grounds.

II. FUNCTION DURATION

A. Herring Management: 15 April 1988 through 30 June 1988.

B. Salmon Enumeration (weir counts): 25 May 1988 through 10 August 1988.

C. Salmon Management: 1 June 1988 through 15 September 1988.

D. Biological Sampling (AWL): 1 June 1988 through 15 September 1988.

E. Data Analysis and Reports: 15 Sept. 1988 through 4 May 1989.

A. Permanent FB III - Mike Thompson - Area Management Biologist

B. Permanent Pilot - Ralph Wright - Pilot

C. Permanent/Seasonal FB I- Laura Pillifant - Chignik Weir

D. Permanent/Seasonal FB I - Jeff Fox - Chignik Weir/Scale Analysis.

E. Permanent/Seasonal FB I - Bob Wilkey - Chignik Weir

F. Permanent/Seasonal FB I - John Kingeter - Chignik Weir/Biological Sampling

G. Permanent/Seasonal FT I - Cheryl Hemke - Biological Sampling

H. Permanent/Seasonal FT I - Brett Lechner - Biological Sampling

I. Permanent/Seasonal FT II - Patty Roche - Chignik Weir/ Biological Sampling

J. Permanent/Seasonal FB I - Doug Molyneaux - Herring Chignik

V. NARRATIVE OF ACTIVITIES

Departure

The state vessel M\V RESOLUTION will be loaded with supplies and materials 4 May to 8 May and will depart Kodiak for Chignik 8 May. Upon arrival at Chignik Lagoon, the materials will be ferried up river to the field station via barge and seine boat.

Maintenance

The first week to ten days will be spent opening up the camp, working on the water system, generators, skiffs and getting outboard motors in operable condition. Whenever time permits during the field season, maintenance and upgrading of the facilities and equipment will be carried out.

Weir Construction

Prior to weir construction, the pile driver and piling, scow, gates and other weir material will be readied. The piling

will be driven during early May. The placement of weir panels will start immediately after all piling are driven.

Herring Management

From 15 April through 30 June the commercial sac-roe herring fishery will be monitored. Management procedures will be conducted as outlined in the 1988 Chignik Area Roe Herring Management Plan.

Salmon Enumeration

Salmon will be counted through the weir according to procedures followed in the past. Counting will start as soon as the weir is fish tight.

Adult Sampling

The objective of the 1988 commercial catch sampling program is to collect 625 sockeye scales and 450 coho scales every 5-7 days throughout the duration of the commercial fishery. Prior to the commercial fishing season and during extensive commercial fishing closures catch sampling will be conducted during the test fisheries.

Sampling will also be conducted at Black Lake in order to collect age specific data for early run sockeye. Approximately 2,500 scales will be collected in June and early July until a total sample size of approximately 2,500 scales are obtained.

Management Activities

Management of the Chignik River system is based on the daily catch and escapement of sockeye salmon, age composition and scale pattern analysis, as well as data collected in previous years on timing and optimum escapement. Aerial surveys will be flown to assess the timing, distribution and magnitude of the spawners in each spawning area.

There are about ninety salmon streams within the Chignik Area which are regularly surveyed for escapement counts, fish movements and commercial fishery activities. Regulatory markers are checked and replaced when necessary.

Immediate catch information is received on the radio from tenders and processors. When the fish tickets are received, the data is logged in the computer. This catch information, along with aerial observations and catch and escapement figures from past years, are used for a day-to-day evaluation of the fishery. Emergency orders for openings and closures are used as the main tool in managing the fishery. At times stream guards will be placed at various locations throughout the area for enforcement and reporting purposes.

I. PROJECT TITLE: Chignik Weir Salmon Enumeration

A. Problem Statement and Objectives

The Chignik River system sockeye run is comprised of two major stocks which are designated by the lake and the fish rear in as juveniles. The runs are termed early run (Black Lake run) and the late run (Chignik Lake run). The two lakes are interconnected and share a common outlet river. The stocks spawn in different areas, have a different time of spawning migration, and length of fresh water residence as juveniles and age at maturity (Higgins 1934; Narver 1963).

Minimum escapement goals for the Chignik sockeye salmon stocks are 400,000 for the Black Lake stock and 250,000 for the Chignik Lake stock. Since 1966 the Chignik sockeye returns have been managed to achieve these escapement goals. Managing for these escapement goals and a commercial harvest of the surplus is complicated by the overlap period (mid-June to mid-July) when both stocks are present in the fishery. Accurate escapement

information, catch statistics, scale pattern analysis and overall age composition are used in-season to assure that these objectives are met. Post-season estimates of the total catch and escapement and age composition of each stock are needed to compile brood-year tables and provide the necessary data to forecast future returns.

B. **Description of the Fishery**

The Chignik commercial salmon fleet is strictly purse seine, no other gear types are allowed. In 1987, there were 102 registered commercial salmon permit holders.

Sockeye salmon are the most important fishery resource in the area. During the months of June and July all commercial fishing activity is focused on this species. From mid-July through August in years of high pink and chum salmon returns some of the commercial fishing effort will be directed towards these fisheries.

The majority of the commercial fishing fleet and fishing activity takes place within Chignik Lagoon. Approximately 20 of the 102 registered permit holders direct their effort to the outside cape areas of the Chignik Management Area.

III. PROJECT NARRATIVE: Chignik Weir Salmon Enumeration

A. **Duration:** 25 May through 20 August or until daily sockeye salmon counts are less than 1,000.

B. **Location:** Chignik

C. **Personnel:** As previously listed three Permanent/Seasonal FB I's are required to enumerate salmon . During peak counts (due to added job duties) additional help is required from the sampling crew.

D. **Chignik Weir Salmon Enumeration**

Three counting gates with white "flash" boards are installed at selected sites in the weir. Two of the gates are 2 feet wide and the middle gate is approximately 4 feet wide and located in shallow water in the middle of the weir.

The normal counting procedure is conducted as follows:

The gates are numbered 1 through 3 starting at the field station side of the river. Typically, counting gages one and three are opened in succession at 7:00 A.M. and closed in the same manner at 10:00 P.M. Gate two is used during peak escapement periods or in poor visibility conditions, i.e. high water or turbid conditions.

A 10-minute count is made at each gate hourly. The 10-minute count for each gate is then multiplied by 6 to give a full hourly count through the gate. The totals of all gates are added for the total hourly count through the weir. Fish counts through the boat gate must also be added to the daily escapement.

The last counter will deliver a daily and accumulative total count to the radio desk at the end of counting for the day. <u>Counts are double checked for accuracy</u>.

Counting schedules are assigned on a rotating basis. If we have a 3 person counting crew for the 1988 season, each individual will be required to count for five hourly time periods daily at whatever time period is scheduled. Opening of the boat gate for skiff passage is normally done on a volunteer basis. A white flash panel is installed immediately upriver of the boat gate to allow enumeration when the gate is opened for boat passage.

I. **PROJECT TITLE: Chignik Catch Sampling and Catch Allocation**

II. **PROJECT JUSTIFICATION**

A. **Problem Statement and Objectives**

As previously stated the sockeye salmon return into the Chignik River system is the most important fishery resource in the area. The total sockeye return is composed of two separate stocks. The early run (Black Lake stock) enters the Chignik system in early June with the peak of the run occurring near the end of June. These fish primarily spawn and rear in Black Lake, Alec River and their tributaries. The late run (Chignik Lake stock) enters the fishery in late June and continues through September with the period of peak abundance usually occurring during the third week of July. The adults from this stock spawn in the tributaries to Chignik Lake, Chignik Lake beach areas, and Black River tributaries.

During the commercial salmon fishery an intensive catch sampling program is conducted to provide the necessary data on which to base management decisions. Age composition and scale pattern analysis is used for placement of the average time of entry curve (ATOE). The ATOE curve is used to determine the percent composition of each stock in the catch and escapement. This is particularly important during the transition period. This information enables the area biologist to assess the strength of the two returns and formulate management strategies for the commercial harvest of the surplus.

Post-season analysis is conducted using all scales collected throughout the season in order to more accurately estimate the stock composition of the Chignik sockeye salmon return. This analysis uses scale patterns and linear discriminant function analysis. The data

derived from this analysis along with the escapement data is used to estimate the total catch and escapement. In turn this information is used to compile brood-year tables and other necessary data to forecast future returns.

III. PROJECT NARRATIVE: Catch Sampling, Commercial Fishery, Chignik Lagoon

A. **Duration:** 1 June through 15 September or until the end of the commercial fishery.

B. **Location:** Chignik

C. **Personnel:** As previously listed one crew leader and two samplers are required to collect scale samples from the commercial fishery.

D. **Procedures: Chignik Lagoon Sampling**

1. For sockeye salmon, 625 fish samples are collected from the commercial catch every 5-7 days during June and July. During the transition period, from approximately 15 June to 25 July this sampling effort is increased by an additional 300 to 625 samples per week.

    a. Samples will be collected on tenders as the catches are being offloaded from the fishing boats. The skipper should be questioned to ensure that the fish were caught during the current day and in the Lagoon.

    b. Since the Chignik fishermen usually offload to tenders only once or twice a day, and most deliveries are made in the evening, the sampling should begin at approximately 4:00 P.M.

c. A systematic sampling procedure is followed in the collection of the samples. The third brailer of 8-10 different boats delivering to the tender is sampled until the sample goal is achieved. Scales and lengths are taken from each fish. An 8-10 boat sample should represent approximately 10-20% of the total effort in the Lagoon.

2. During August and early September, 625 fish samples are collected every 7-10 days. The procedure described above is followed as long as the sockeye are abundant enough to sample. As abundance declines it may be necessary to sample all available fish and sample on two consecutive days.

3. During August and early September, coho salmon are sampled in the commercial catch. For coho salmon up to 450 fish are sampled per week following the same procedures as sockeye sampling except that two scales are taken per fish due to the high regeneration rate.

4. Chinook Salmon (scale samples)

Sport caught Chignik River chinook salmon will be sampled whenever possible during the 1988 season. Sport fishermen passing through the boat gate are requested to present their catch to ADF&G personnel at the weir for sampling. The information recorded should include the sex, length and date caught. The preferred scale is removed and placed on a gummed card (refer to catch samplers guide for preferred scale). Whenever possible the fish may be weighed on the large scale under the bunkhouse for the

benefit of the angler. Lengths of fish are measured from the middle of the eye to the fork of the tail. All written information will be recorded on a Rite-in-the-Rain book and later transcribed to mark-sense forms. In addition a minimum of 200 chinook will be sampled from the commercial catch throughout the 1988 season.

IV. **PROJECT NARRATIVE: Collection of Sockeye Salmon Scales, Black Lake.**

A. **Duration:** 1 June through 10 July

B. **Location:** Black Lake

C. **Personnel:** As previously listed one crew leader and two samplers are required to collect scale samples from Black Lake.

D. **Procedures**

Two thousand five hundred (2,500) fish samples are collected at the traditional beach seine site at the outlet of Black Lake. The first sample should be taken as soon as 200,000 fish have been counted through the weir. Subsequent samples should be taken until the goal of 2,500 samples has been met. All sampled fish should be adipose fin clipped to prevent sampling the same fish twice. The scale samples collected from Black Lake will provide the data to set the standards used to differentiate between the two stocks.

I. **PROJECT TITLE: Chignik Area Management and Research Activities**

II. **PROJECT JUSTIFICATION**

A. **Problem Statement and Objectives**

Salmon - Management of the Chignik River system sockeye return is based on daily catch and escapement figures, age composition, scale pattern analyses, and run strength and timing regarding the average time of entry curve (ATOE). Intensive aerial surveys will be flown in other areas of the Chignik Management Area to assess the timing, distribution, and magnitude of returning salmon in each spawning area.

There are approximately 90 salmon streams within the Chignik Area which are regularly surveyed for escapement counts, fish movements and commercial fishing activities. Regulatory markers are checked and replaced when necessary.

Daily radio contact is maintained with tenders and processors in order to receive up to date catch information. The catch data, aerial observations and historical catch and escapement figures are used to evaluate the fisheries in progress. Emergency orders (i.e. to open and close the fishery) are used as the primary tool to manage the fisheries.

Herring - Several relatively small geographic areas have been identified throughout the past eight years as supporting the majority of Chignik's herring spawning biomass. These small areas are managed as discrete stocks (Figure 1). The annual harvest for each known stock is dependent upon the previous year's post-fishery biomass estimates and an exploitation rate of 0-20% of the available spawning biomass. The desired exploitation rate depends upon an evaluation of each stock's status as

to trends in biomass, recruitment, and overall age composition. By regulation, the sac-roe season extends from 15 April through 30 June. In-season management further regulates the fishery by allowing alternating 24 hour fishing periods, between 24 hour closures. Each fishing period will begin at 12:00 noon on odd numbered days throughout the regulatory season or until the desired harvest level is achieved for each geographic area (stock). Pre-season harvest expectations for each stock may differ from the actual harvest levels if in-season fishery and stock performance indicate major changes in the health of any given stock.

The fishery is monitored by means of frequent contact with fishermen and frequent aerial observations of the fishery and the available herring stocks, as well as daily contact with processors and ADF&G field crews which are strategically placed to monitor this freely roaming fishery. An integral element in successfully managing this type of fishery, i.e. a low yield and long duration fishery by highly efficient gear, is the information collected from fishermen and commercial spotter reports. This cooperation is definitely encouraged and will be treated confidentially in-season as it has in the past.

III. **PROJECT NARRATIVE: Management and Research Activities for the Chignik Area Commercial Finfish Stocks.**

A. **Duration:** 1 July 1988 - 30 June 1988.

B. **Location:** Kodiak, Alaska and Chignik, Alaska

C. **Personnel:** As previously listed. One area management biologist, a pilot and an FB I Perm/Seasonal performing the scale reading and digitizing.

D. **Procedures**

During the field season from 15 April through 15 September, the Chignik Area is managed from the Department field office located on the Chignik River. The area biologist is headquartered in Kodiak during the remainder of the year.

The salmon management activities include annual installation and maintenance of a four hundred foot pile driven weir across the Chignik River. Sockeye and chinook salmon escapements are obtained at the weir while all other escapement data is obtained via fixed wing aircraft throughout the entire Chignik Area. Catch statistics are closely monitored via daily radio contacts with tenders and processors.

An annual summation of fishery statistics and management and research activities is compiled while in Kodiak. Other activities during this period include budgeting, analysis and interpretation of field data, regulation changes through the Board of Fisheries and preparation of salmon forecasts. Purchasing of materials and hiring of seasonal employees are carried out in the winter and spring.

Research activities carried out by the management staff are discussed in sections of this report dealing with individual species.

E. **Test Fisheries**

Test fishing in Chignik Lagoon will be done once or twice before the season opener, and as needed during the remainder of the season. Reasons for test fishing include assessment of run strength and attaining needed A.W.L. data. The test fisheries prior to the season

opening are needed and should be conducted around 1 June and 5 June in a normal year as far as run timing. If escapements are behind, a test fishery should be conducted every 2-3 days to anticipate or prevent a major buildup in the lagoon and prevent a large influx of fish entering the river all at once.

A boat must be contacted to do the test fishing the day prior to the fishery. The vessel will be paid $300.00 for the charter and $1.00 per fish that are retained for the sample. Approximately 600 fish will be sampled and sold to a processor. A short term vessel charter must be completed and payment will be made with an FPO charged to the test fish account.

The actual test fishing should be done as near to high tide as possible with about 4-6 sets made throughout the lagoon. The test areas are depicted on the map attached (Figure 2). The sets should be made blind and the set should be held at hook for ten minutes before closing. All fish should be counted or estimated by the skipper and recorded in a notebook for each set. The first 600 fish should be retained and all others should be released unharmed.

After the fish are worked up they can be sold to a cannery. A copy of the fish ticket, FPO and short term vessel charter should be sent in to Linda Wright in Kodiak.

All data from the test fishery should be turned in to the Area Management Biologist upon completion. This current data and resultant catch and escapement data will be compiled in a historic data file.

F. **Fish Ticket Pick-Up**

Procedure: Fish tickets should be picked up daily from processors and tenders in the Chignik Area. After 10 July the tickets can be picked up less often, i.e. twice weekly.

The person responsible for picking up the tickets will have to leave the weir with one of the big whalers about an hour and a half before high tide at the weir, thus allowing 3 hours to get back to the camp and still have enough water. (Always take a spare motor, oar and tool box.) The first stop should be the shore based processors in Anchorage Bay. The fish tickets are located in the offices of the canneries. Identify yourself and state that you are there to pick the ADF&G (yellow) copy of the fish tickets. After the shore plants are visited you should stop at each floating processor in the bay and get their tickets. On the way back through the lagoon stop at all the tenders and get their tickets. Keep all tickets dry in a case or plastic bag. If no problems occur and the individual is prompt in his actions there should be plenty of water in the river to return under power through the shallows. If time permits stop at CWF to check for ADF&G mail.

G. **Fish Tickets**

Fish tickets will be collected daily and delivered to the management biologist's desk. All tickets must be edited for the following correct information. Any corrections should be made in red ink and initialed.

1. ADF&G number
2. Permit Number
3. Processor Code
4. Number of fish by species
5. Number of pounds by species
6. Statistical Area

7. Date of Harvest

After editing, the tickets should be put in batches of 200 or less and numbered sequentially with the auto numbering machine and recorded in the fish ticket batch log. Each batch will have a number and be filed in a separate envelope. The completed envelope can now be given to the key punch person to be entered on the micro-computer.

H. **Catch Information**

Radio processor reports:

Radio contact is made with processors/tenders twice daily at 8:00 A.M. and P.M. Usually contacts will be made within the first hour of calling the processors. The reports from processors must include:

A. Number of fish by species
B. Statistical area of harvest
C. Date of Catch
D. Pounds of fish by species
E. Number of deliveries
F. Company and code names

Most of the data received over the radio will be in code. If they don't have a code sheet they are still required to give us the information (code sheets will be issued as soon as possible to new companies in the area).

All this data from the radio communications is entered in the 1988 daily salmon catch log. All catches from statistical area 271-10 will go on a separate sheet, all other statistical areas can be listed individually on the second page of the daily log. Generally the morning report for the previous day's catch will be the most accurate and used for projections.

Projections of the daily harvest can be made by dividing the number of fish by the number of deliveries reported

thus giving an average catch per boat. The average catch per boat can be multiplied by the number of boats fishing to get a daily harvest projection.

IV. **PROJECT NARRATIVE: Chignik Area Aerial Stream Surveys**

A. **Duration:** 15 April through 15 September

B. **Location:** Chignik Area

C. **Personnel:** One pilot and a spotter who is normally the area biologist. In absence of the area biologist the spotter position is filled from existing staff at Chignik weir.

D. **Procedures - Herring**

Aerial observations are the only method of assessing herring biomass and spawn sightings. This information is used to determine the total biomass of a particular stock within a bay, which is used in-season to monitor the exploitation rate of a particular stock.

Aerial surveys need to be conducted as frequently as possible to keep abreast of the biomass, commercial fishing activity and location, and to prevent overexploitation of the herring spawning stocks. Surveys should be conducted during the early morning hours and late afternoon as close to high tide as possible. When schools are spotted, an estimate based on the number of tons within that school should be made. Important factors to consider in making this estimate are surface area of the school, shape of the school, location regarding depth of the water and altitude of the airplane when the estimate is made.

Recommended altitude when conducting herring surveys is approximately 2,000 feet. This may vary depending upon conditions, i.e. weather, wind, etc. that will affect the survey. If commercial spotters are within the area try to obtain their information regarding the number of

schools spotted and size. Treat all information confidentially.

E. **Procedures - Salmon**

Aerial surveys are the only method of assessing escapement for most of Chignik Area's various pink and chum salmon streams. Surveying usually starts about the middle of July and extends until the first or second week in September when peak survey counts are conducted.

Once aerial surveys have started the entire Chignik Area should be surveyed at least once a week. The time involved to survey the entire Chignik Area is usually about 3 full days depending on the time of the survey and numbers of fish present, one day for the Western and Perryville Districts, one day for Chignik Bay and Central District, and a full day for the Eastern District. A full day of surveying usually consists of about 6 to 8 actual hours in the air and a couple of hours for stops and refueling.

All streams to be surveyed are listed in the stream survey logs and are given individual stream numbers. The normal sequence might be to fly the mouth of each stream and survey the ocean areas adjacent to the mouth for incoming fish. Fish should be recorded as to number and species for each stream. The survey should continue up the stream until no more fish are observed. Additional streams on the North Peninsula may also be surveyed by the Chignik Area biologists at the request of Arnie Shaul. For further information concerning stream surveys in the Chignik Area see "Arnies Tips for Chignik Salmon Management".

V. PROJECT NARRATIVE: **Catch Allocation - Salmon scale analysis and digitizing.**

A. **Duration:** March - 31 January.

B. **Location:** Chignik, Alaska and Kodiak, Alaska

C. **Personnel:** One FB I Perm/Seasonal to analyze scales for age and scale patterns to determine stock composition of the Chignik system sockeye run.

D. **Procedures:** Estimate the stock composition for the Chignik sockeye salmon run using scale pattern and linear discriminant function analysis using methods and procedures developed by Conrad (1984). An in-season application of the procedure will be used to assist the area management biologist in evaluating the strength of the two Chignik system sockeye runs enabling him to manage the commercial harvest in the most effective manner.

E. **Data Analysis:** Data collection for these studies will be analyzed and stored on a micro-computer. Scale samples will be preserved on acetate cards.

GENERAL

Safety Program

Firearms:

No loaded firearms will be carried into or kept in any building. Rifles carried into the field or in skiffs **will not** have a shell in the chamber. At the beginning of the season all Fish and Game personnel will be checked out on their handling, care, and knowledge of firearms before being allowed to use firearms during State business. All other gun safety precautions should be exercised in handling any firearms. The rifles should be kept cleaned and oiled.

Skiffs:

No one should leave camp without telling someone where they are going and when they expect to return. Common sense should be used at all times. The weather can change very suddenly.

The following equipment should always be in the skiff:

Life Jacket (wear)

Life Cushions

Tool Box with Tools

Oar(s)

Shear Pins

Cotter Pins

Propeller

Spark Plugs